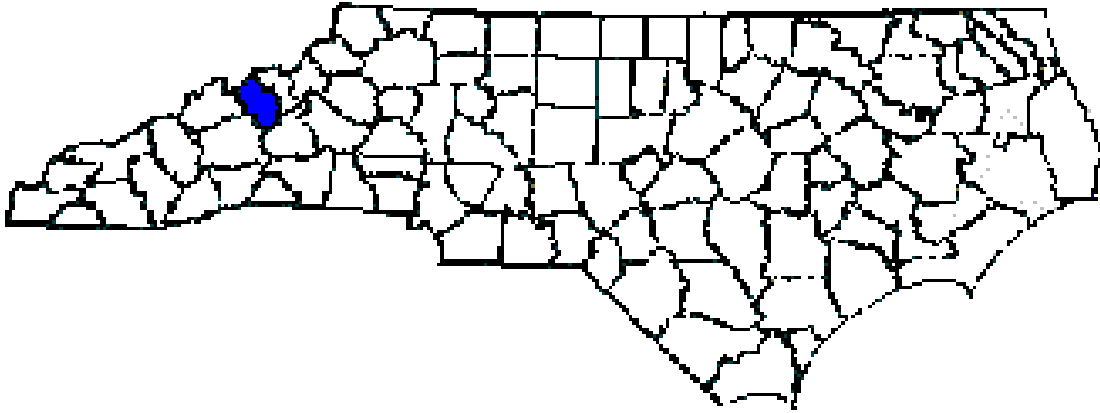


ANNUAL REPORT FOR 2010



**UT to Bald Creek (Hydro Site) Permit Site #7
Mitigation Site
Yancey County
TIP No. R-2518B**



Prepared By:
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SUMMARY

The following report summarizes the stream monitoring activities that have occurred during the Year 2010 at the UT to Bald Creek (Hydro Site) Mitigation Site in Yancey County. The North Carolina Department of Transportation (NCDOT) completed this project in April 2009. This report provides the monitoring results for the first formal year of monitoring (Year 2010). The Year 2010 monitoring period was the first of five scheduled years of monitoring on the UT to Bald Creek (Hydro Site) Mitigation Site (See Success Criteria Section 2.1).

Based on the overall conclusions of monitoring at UT to Bald Creek (Hydro Site), it has met the required monitoring protocols for the first formal year of monitoring. The channel throughout the stream relocation site is stable at this time. The streambank and buffer area have not been planted for the first year of monitoring. NCDOT will monitor the planted vegetation once it is established.

NCDOT will continue stream monitoring at the UT to Bald Creek (Hydro Site) Mitigation Site for 2011.

1.0 INTRODUCTION

1.1 Project Description

The following report summarizes the stream monitoring activities that have occurred during the Year 2010 at the UT to Bald Creek (Hydro Site) Mitigation Site. The Hydro Site is located on US 19 in Yancey County at Sta. 133+40 to Sta. 134+80 -L- (Figures 1 & 2). The UT to Bald Creek (Hydro Site) was constructed to provide mitigation for stream impacts associated with Transportation Improvement Program (TIP) number R-2518B in Yancey County.

The mitigation site provided approximately 443 linear feet of stream relocation. Construction was completed during April 2009 by the NCDOT. Stream relocation involved excavation of a floodplain and channel. In-stream cross vane structures were used to stabilize the channel pattern. The riparian buffer zone will also be planted.

1.2 Purpose

In order for a mitigation site to be considered successful, the site must meet the success criteria. This report details the monitoring in 2010 at the UT to Bald Creek (Hydro Site) Mitigation Site. Hydrologic monitoring was not required for this site.

1.3 Project History

April 2009	Construction Completed
October 2009	As-Built Survey Completed
November 2010	Stream Channel Monitoring (Year 1)

1.4 Debit Ledger

The entire UT to Bald Creek (Hydro Site) stream mitigation site was used for the R-2518B project to compensate for unavoidable stream impacts.

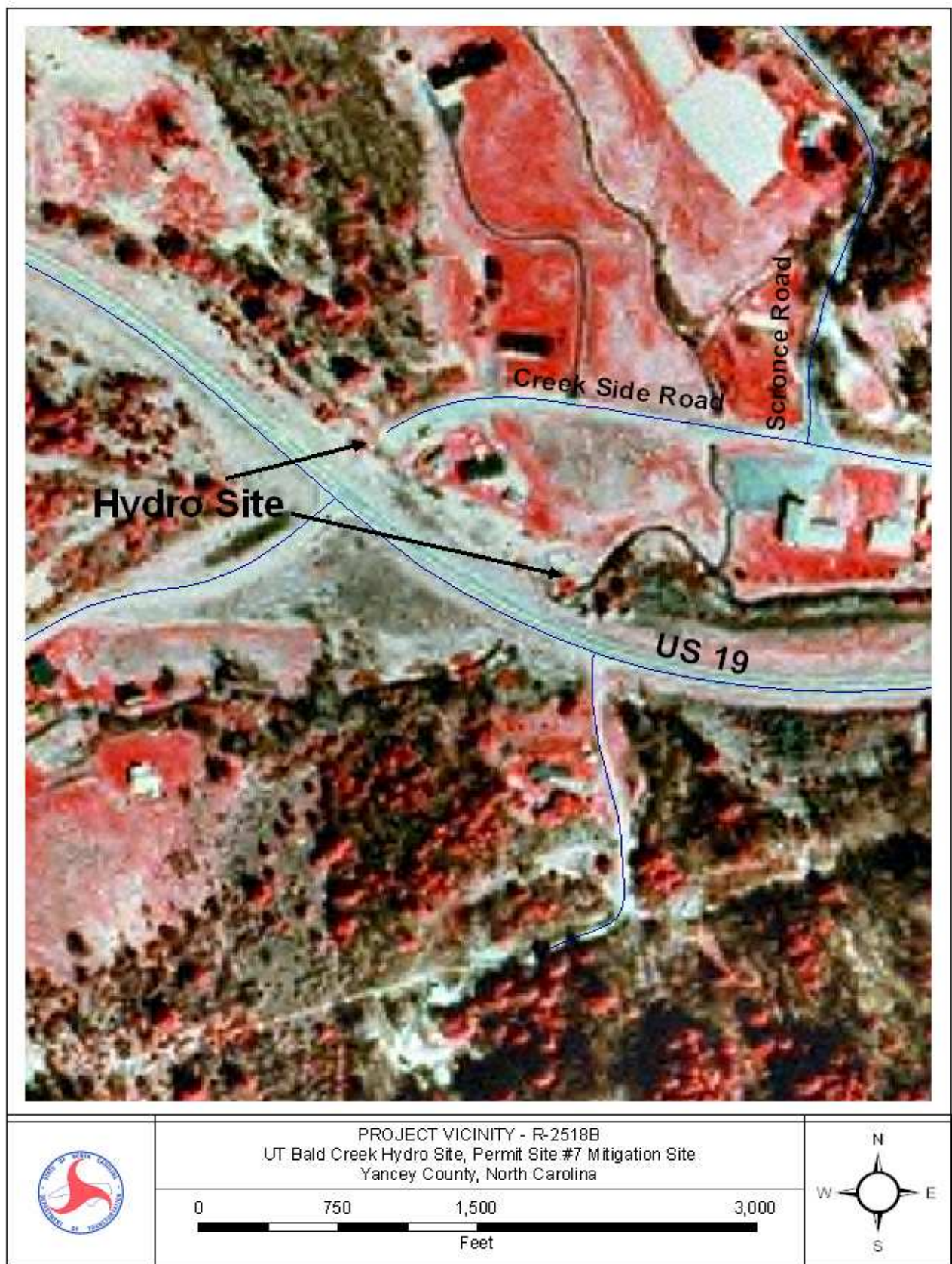
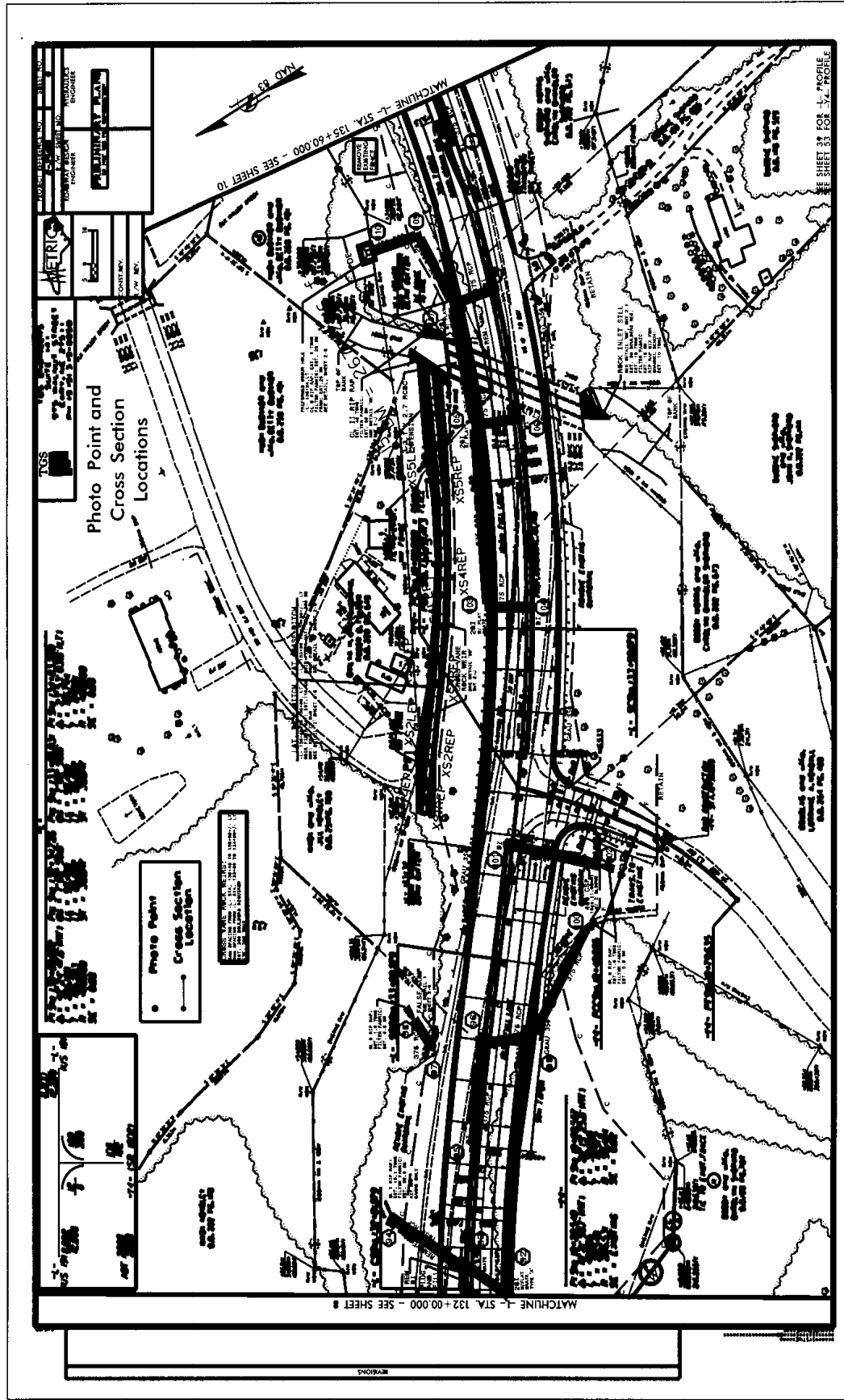


Figure 1. Vicinity Map



2.0 STREAM ASSESSMENT

2.1 Success Criteria

The permittee shall monitor the restoration and enhancement mitigation sites following the Level 1 protocols outlined in the "Stream Mitigation Guidelines," dated April 2003 with the following exceptions:

1. Pebble counts shall not be conducted.
2. Two cross sections shall be conducted for streams less than 500 linear feet and five (5) cross sections shall be conducted for streams greater than 500 linear feet.
3. Riparian success shall be by visual inspection of plant survival. Photos will be taken and comments noted on plant survival.

The permittee shall monitor the preservation sites by visual inspection. Photos will be taken and comments noted on plant survival. The monitoring shall be conducted annually for a minimum of five (5) years after final planting. The monitoring results shall be submitted to DWQ in a final report within sixty (60) days after completing monitoring. After 5 years the NCDOT shall contact the DWQ to schedule a site visit to "close out" the mitigation site.

2.2 Stream Description

2.2.1 Post-Construction Conditions

The relocation of UT to Bald Creek (Hydro Site) Mitigation Site involved excavation of a floodplain and channel. In-stream cross vane structures were used to stabilize the channel pattern. The riparian buffer zone will also be planted.

2.2.2 Monitoring Conditions

The objective of the UT to Bald Creek (Hydro Site) stream relocation was to restore a B stream as identified in Rosgen's Applied River Morphology. A total of five cross sections (three in a riffle and two in a pool) were surveyed. For this report, only cross sections containing riffles were used in the comparison of channel morphology presented below in Table 1 (Hydro Site).

Table 1. Abbreviated Morphological Summary (UT to Bald Creek - Hydro Site)

Variable	Proposed	Cross-Section #1 (Riffle)	Cross-Section #3 (Riffle)	Cross-Section #5 (Riffle)	Min. – Max Values (Riffle Sections Only)
		2010	2010	2010	2010
Drainage Area (mi ²)	0.03	0.03	0.03	0.03	0.03
Bankfull Cross Sectional Area (ft ²)	16	8.62	1.03	11.63	1.03 – 11.63
Maximum Bankfull Depth (ft)	2	1.07	0.52	1.46	0.52 – 1.46
Width of the Floodprone Area (ft)	22	16.72	23.23	22	16.72 – 23.23
Bankfull Mean Depth (ft)	1.33	0.71	0.23	0.91	0.23 – 0.91
Width/Depth Ratio	9	17.11	19.57	14.05	14.05 – 19.57
Entrenchment Ratio	1.83	1.38	5.16	1.72	1.38 – 5.16
Bankfull Width (ft)	12	12.15	4.5	12.79	4.5 – 12.79

* Riffle values are used for classification purposes, pool values are shown in Appendix A.

2.3 Results of the Stream Assessment

2.3.1 Site Data

The assessment included the survey of five cross sections and the longitudinal profile of UT to Bald Creek (Hydro Site) established by NCDOT after construction. The length of the profile along UT to Bald Creek (Hydro Site) was approximately 427 linear feet. Five cross sections were established during the as-built monitoring year. Cross section locations were subsequently based on the stationing of the longitudinal profile and are presented below. The location of the cross sections and longitudinal profile are shown in Appendix A.

UT to Bald Creek (Hydro Site) Cross-Sections:

- ◆ Cross-Section #1: Hydro Site, Station 43+00, midpoint of riffle
- ◆ Cross-Section #2: Hydro Site, Station 67+00, midpoint of pool
- ◆ Cross-Section #3: Hydro Site, Station 135+00, midpoint of riffle
- ◆ Cross-Section #4: Hydro Site, Station 240+00, midpoint of pool
- ◆ Cross-Section #5: Hydro Site, Station 335+00, midpoint of riffle

Based on comparisons of the As-Built to Year 1 monitoring data, all of the cross sections appear stable with little or no active bank erosion. Graphs of the cross sections are presented in Appendix A. Future survey data will vary depending on actual location of rod placement and alignment; however, this information should remain similar in appearance. Some aggradation has occurred at cross section #3 but overall the longitudinal profile is showing that the channel is stable for the 2010 monitoring evaluation. Pebble counts were not required per the permit conditions and therefore were not completed.

3.0 VEGETATION: UT to BALD CREEK (HYDRO SITE)

3.1 Description of Species

The following tree species are scheduled to be planted on the stream bank:

Salix nigra, Black Willow

Cornus amomum, Silky Dogwood

The following tree species are scheduled to be planted in the buffer area:

Liriodendron tulipifera, Yellow Poplar

Platanus occidentalis, Sycamore

Fraxinus pennsylvanica, Green Ash

Quercus alba, White Oak

3.2 Results of Vegetation Monitoring

Streambank & Buffer Vegetation: Reforestation has not been completed as of the Year 1 monitoring evaluation.

3.3 Conclusions

NCDOT will monitor the planted vegetation once it is established.

4.0 OVERALL CONCLUSIONS/RECOMMENDATIONS

The UT to Bald Creek (Hydro Site) Mitigation Site has met the required monitoring protocols for the first formal year of monitoring. The channel throughout the stream relocation site is stable at this time. NCDOT will monitor the planted vegetation once it is established.

NCDOT will continue monitoring the UT to Bald Creek (Hydro Site) Mitigation Site in 2011.

5.0 REFERENCES

Stream Mitigation Plan, US Highway 19, R-2518B On-Site Mitigation
Yancey County, North Carolina, February 2007.

Stream Mitigation Plan Sheets for R-2518B, US 19 from east of the Madison
County line to SR 1336, Stream Mitigation (Preservation, Enhancement,
and Restoration), Buck Engineering.

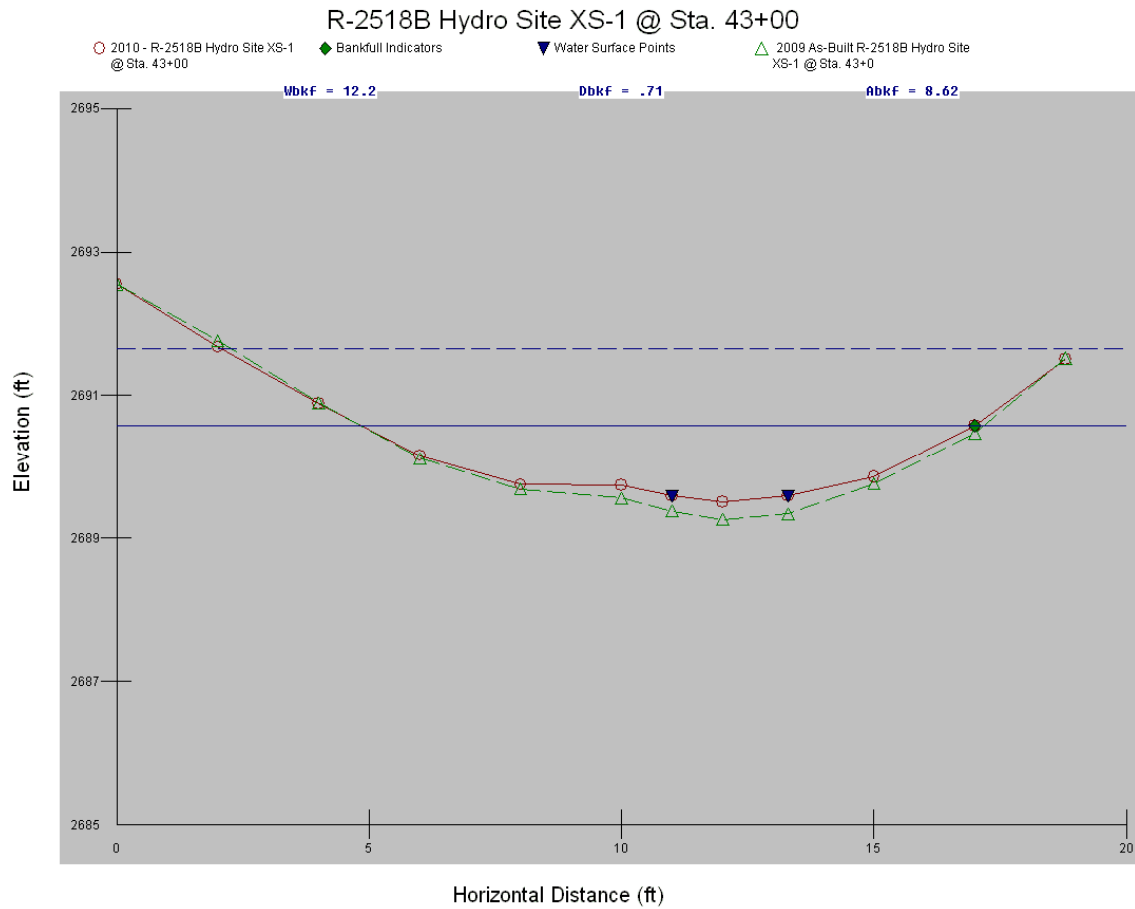
North Carolina Department of Transportation (NCDOT), April 29, 2008. 404 and
401 Individual Permits for R-2518A and R-2518B (ACOE Permit No. 2007-
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Rosgen, D.L, 1996. Applied River Morphology. Wildland Hydrology, Pagosa
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US Army Corps of Engineers (USACE), 2003. Stream Mitigation Guidelines.
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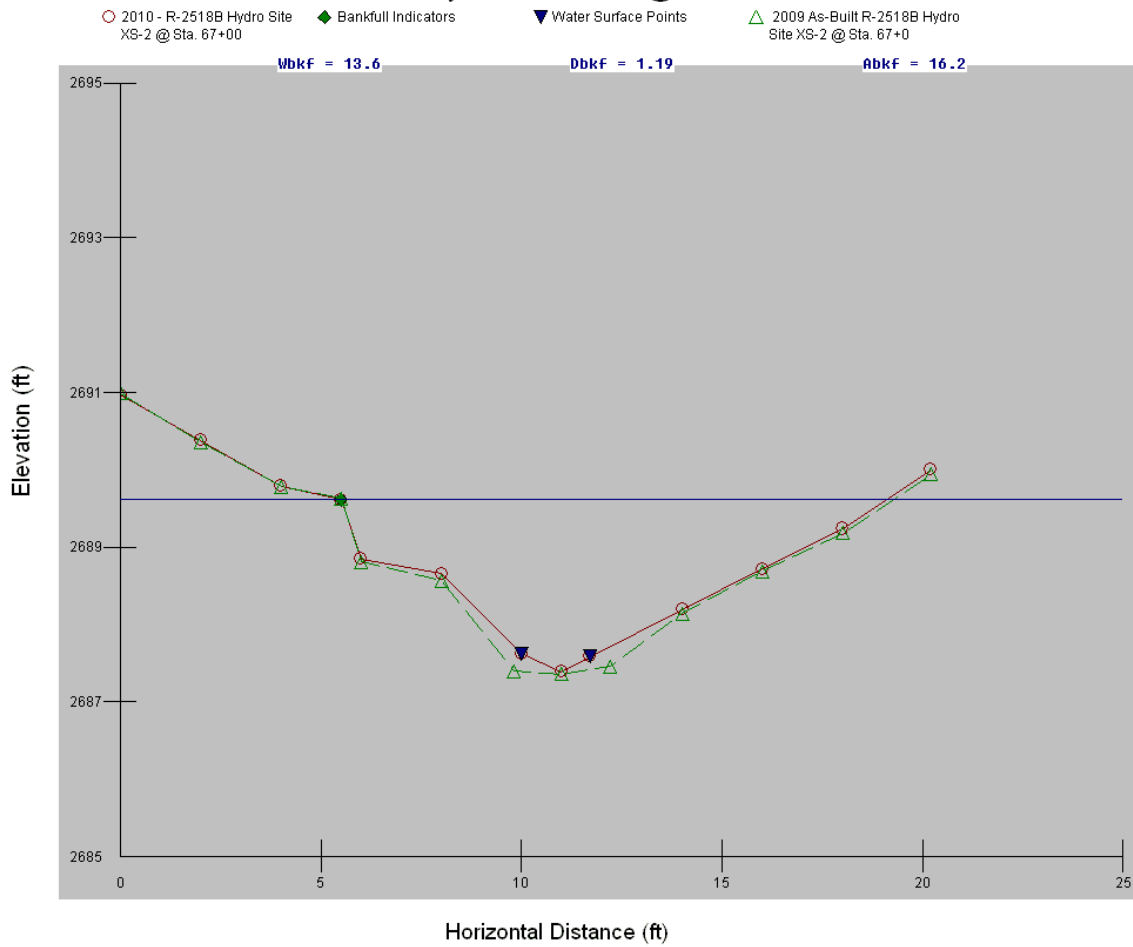
APPENDIX A

CROSS SECTIONS AND LONGITUDINAL PROFILE



Hydro Site: Cross-Section #1 (Riffle) Abbreviated Morphological Summary					
	2010	2011	2012	2013	2014
Bankfull Cross Sectional Area (ft ²)	8.62				
Maximum Bankfull Depth (ft)	1.07				
Width of the Floodprone Area (ft)	16.72				
Bankfull Mean Depth (ft)	0.71				
Width/Depth Ratio	17.11				
Entrenchment Ratio	1.38				
Bankfull Width (ft)	12.15				

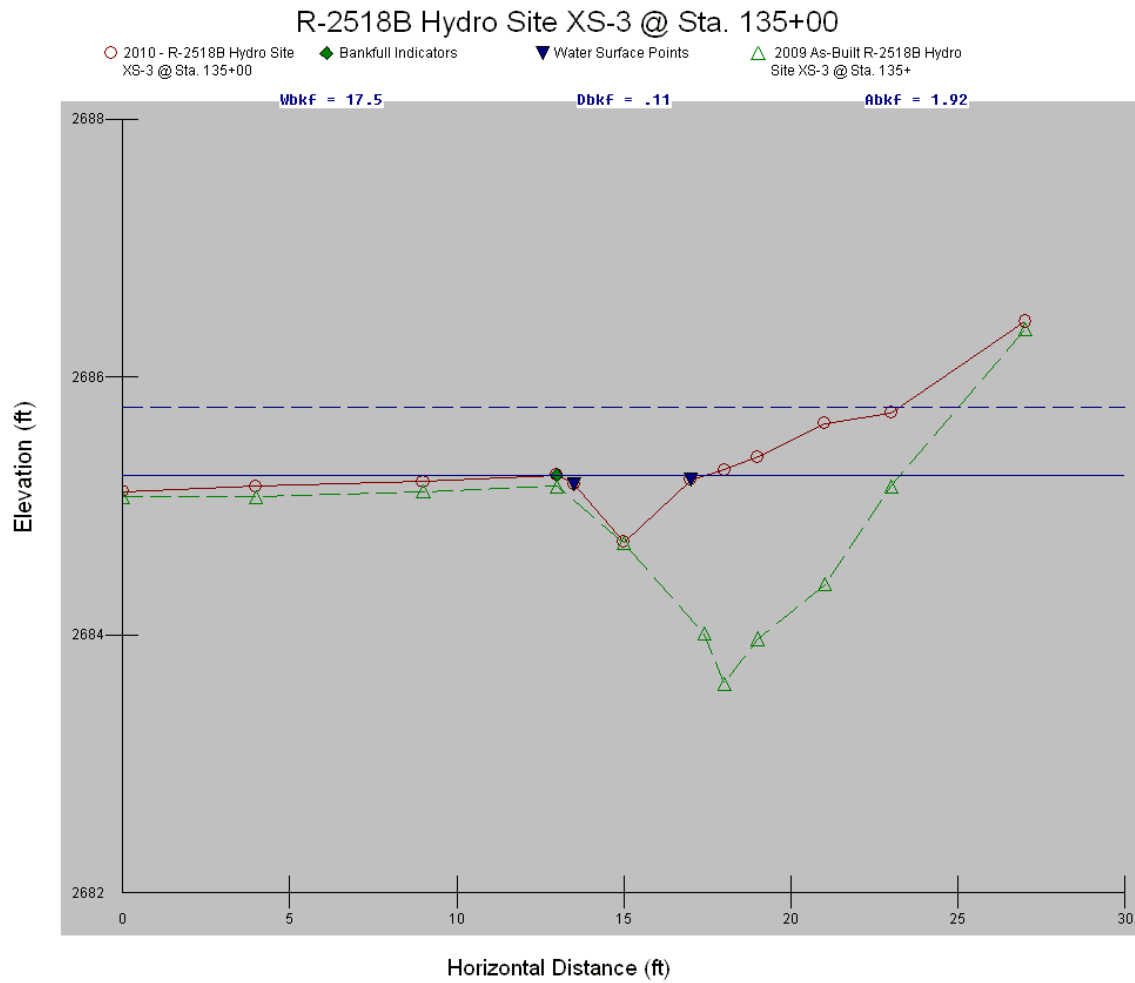
R-2518B Hydro Site XS-2 @ Sta. 67+00



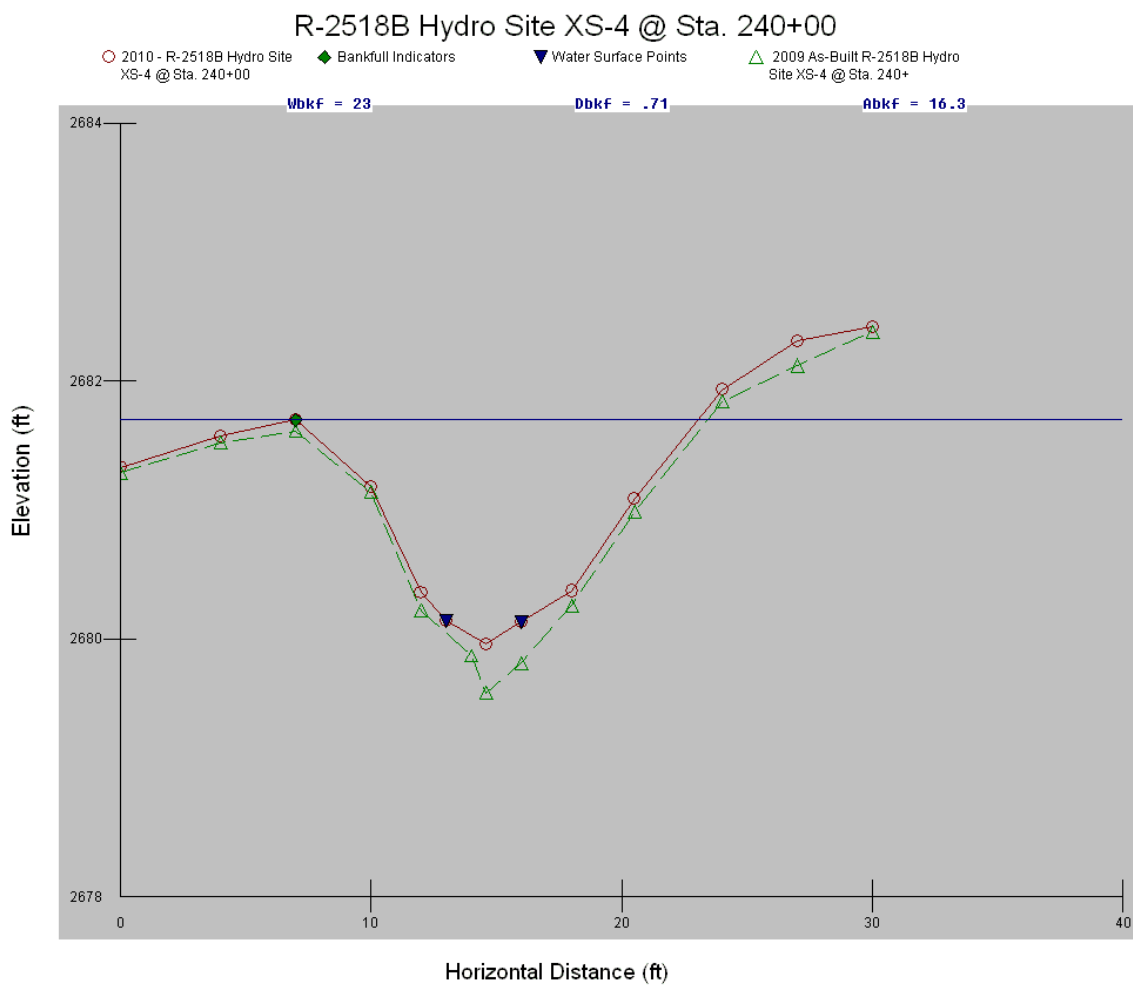
Hydro Site: Cross-Section #2 (Pool) Abbreviated Morphological Summary*

	2010	2011	2012	2013	2014
Bankfull Cross Sectional Area (ft ²)	16.25				
Maximum Bankfull Depth (ft)	2.23				
Bankfull Mean Depth (ft)	1.19				
Bankfull Width (ft)	13.6				

* According to the Rosgen Classification of Natural Rivers floodprone width, entrenchment ratio, and width depth ratio are not measured in pool, glide, or run features.



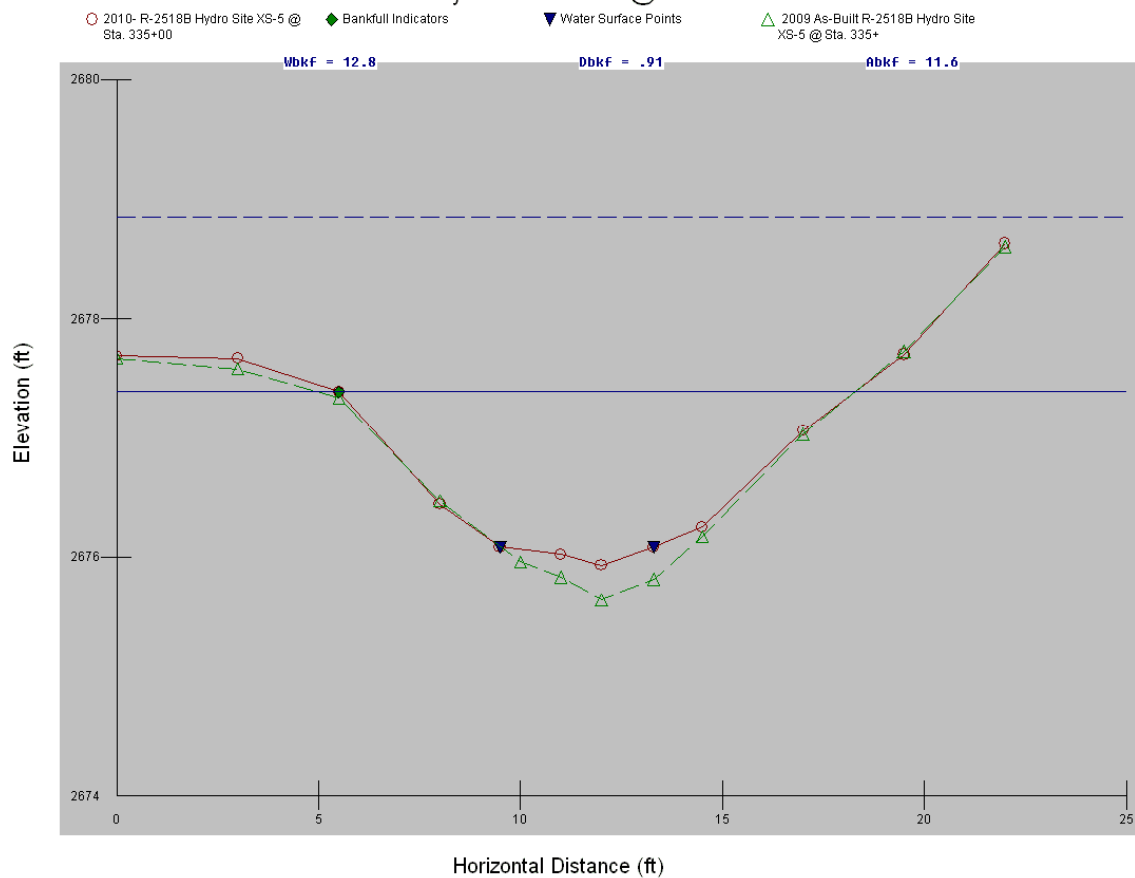
Hydro Site: Cross-Section #3 (Riffle) Abbreviated Morphological Summary					
	2010	2011	2012	2013	2014
Bankfull Cross Sectional Area (ft ²)	1.03				
Maximum Bankfull Depth (ft)	0.52				
Width of the Floodprone Area (ft)	23.23				
Bankfull Mean Depth (ft)	0.23				
Width/Depth Ratio	19.57				
Entrenchment Ratio	5.16				
Bankfull Width (ft)	4.5				



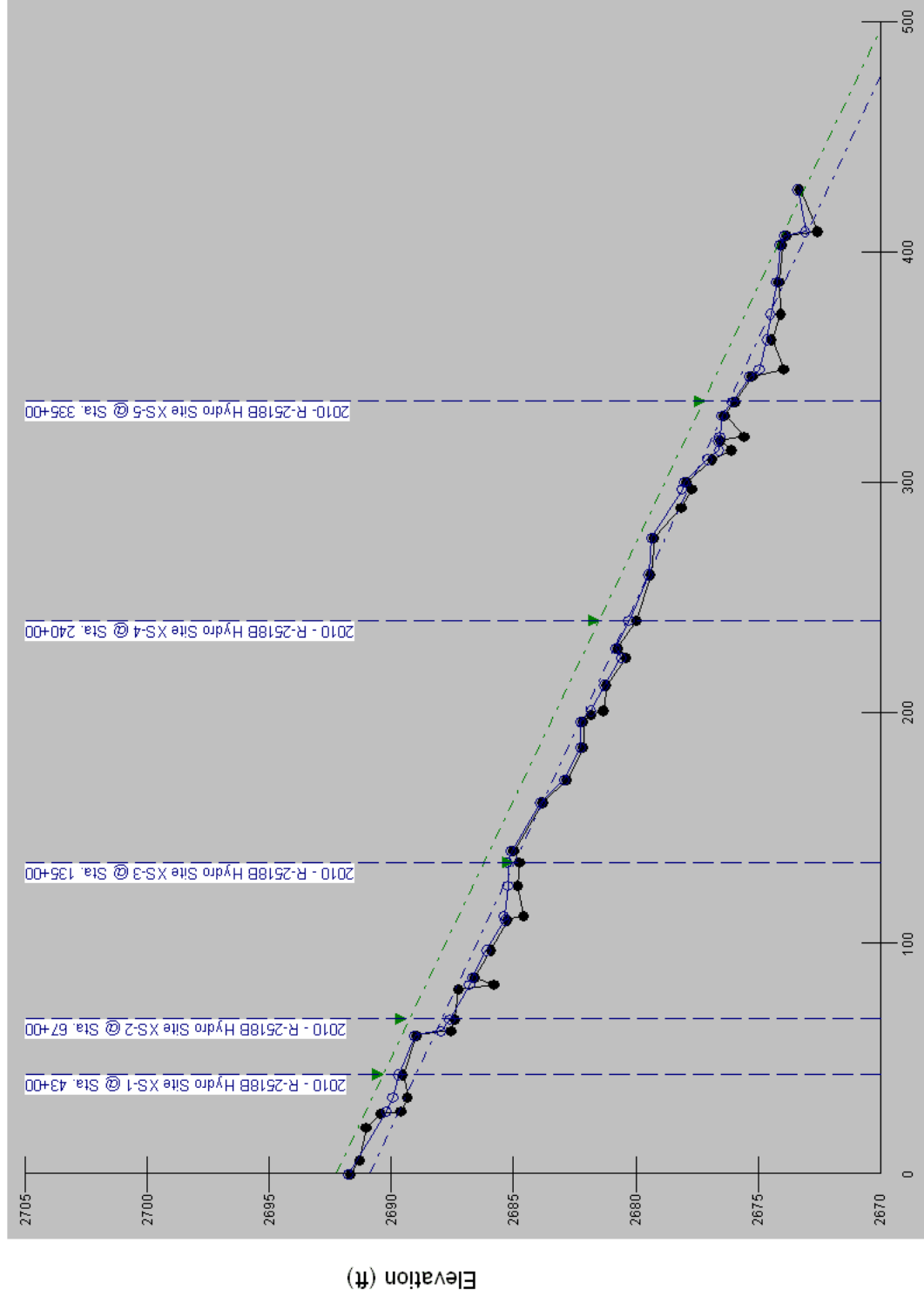
Hydro Site: Cross-Section #4 (Pool) Abbreviated Morphological Summary*					
	2010	2011	2012	2013	2014
Bankfull Cross Sectional Area (ft ²)	15.15				
Maximum Bankfull Depth (ft)	1.74				
Bankfull Mean Depth (ft)	0.94				
Bankfull Width (ft)	16.04				

* According to the Rosgen Classification of Natural Rivers floodprone width, entrenchment ratio, and width depth ratio are not measured in pool, glide, or run features.

R-2518B Hydro Site XS-5 @ Sta. 335+00



Hydro Site: Cross-Section #5 (Riffle) Abbreviated Morphological Summary					
	2010	2011	2012	2013	2014
Bankfull Cross Sectional Area (ft ²)	11.63				
Maximum Bankfull Depth (ft)	1.46				
Width of the Floodprone Area (ft)	22				
Bankfull Mean Depth (ft)	0.91				
Width/Depth Ratio	14.05				
Entrenchment Ratio	1.72				
Bankfull Width (ft)	12.79				



Distance along stream (ft)

APPENDIX B

SITE PHOTOGRAPHS

Hydro Site



Photo Point #1 (Upstream)



Photo Point #1 (Downstream)



Photo Point #2 (Upstream)



Photo Point #2 (Downstream)



Photo Point #3 (Upstream)



Photo Point #3 (Downstream)

November 2010

Hydro Site



Photo Point #4 (Upstream)
November 2010



Photo Point #4 (Downstream)